

Mussey (R. D.)

Alcohol in Health and Disease.

A LECTURE,

INTRODUCTORY TO THE

FOURTH ANNUAL COURSE

OF THE

MIAMI MEDICAL COLLEGE,

AT CINCINNATI,

October 15, 1855,

By R. D. MUSSEY, M. D.,

Prof. of Surgery.

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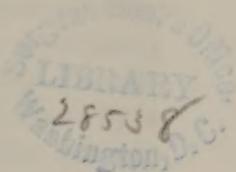
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CORRESPONDENCE.

Miami Medical College, Oct. 17th, 1855.

R. D. MUSSEY, M. D.,

*Dear Sir:—*At a meeting of the Medical Class, JOHN A. THACKER having been called to the chair, and C. T. SIMPSON chosen Secretary, the undersigned were appointed a Committee to solicit for publication a copy of your Introductory Address.

We take pleasure in discharging the duty assigned us, and express the hope that you will oblige us, and your numerous friends, by complying with the request expressed above.

Very Respectfully,

J. C. ROSS,
J. C. WELLS,
A. BUCKINGHAM,
R. P. KEVDALL,
LEWIS WILLIAMS.

To the Committee of the Medical Class:

GENTLEMEN:

The greater part of the Address to which you refer was read some months ago, at a meeting of Physicians; but I have no objection to its being published by the class, if it is thought that the interests of humanity will be promoted by extending its distribution among the members of our profession.

Very Respectfully Yours,

R. D. MUSSEY.

INTRODUCTORY LECTURE.

As the subject of Hygiene has an inseparable relation to the medical profession, I shall not occupy much time in an apology for introducing on this occasion a topic which has no slight bearing upon the physical and moral well-being of individuals and communities: I refer to the influence of alcoholic drinks on the human constitution.

Alcohol, when taken somewhat dilute into the human stomach, produces a sensation of warmth which is, in no long time, diffused among the several organs, accompanied by a general feeling of exhilaration.

The pulse, in half an hour to an hour, is sometimes accelerated to the extent of six to ten beats in a minute, while the respirations are but slightly, if at all, changed in frequency.

In certain conditions of the nerves, however, even small doses of distilled or fermented liquor operate as a direct sedative upon the pulse. I have a medical friend, who, in convalescence from an attack of hemiplegia, tried, (by the advice of his physicians,) wine and Huxham's Tincture of Bark. The taking of a tea-spoonful of either of these articles was very soon followed by a falling of the pulse from 52 to 48 and 46. This effect was uniform on repeated trials. At the same time there was a confused and uncomfortable sensation in the head. The Doctor soon laid aside these remedies, and recovered without them on the blandest food.

For several years past the hypothesis has obtained that alcohol, as containing a considerable proportion of carbon, must be a valuable agent in sustaining the vital temperature by being burnt in the lungs; this hypothesis, too, chiming so well with social customs and individual appetites in almost every class, has widely prevailed. Plausible, however, as this view may be, there is good reason to believe that it is not true.

If alcohol combine with the atmospheric oxygen admitted to the lungs in respiration, it is natural to ask, why is there not at the same time an increased exhalation of carbonic acid? But so far from this being the fact, it has been clearly proved by the experiments of Dr. Prout and others, that the amount of carbonic acid discharged from the lungs while alcohol is in the circulation is remarkably diminished.

From the experiments of Bernard, it is inferable that no *combustion*, as it is called, takes place in the capillaries of the lungs; that oxygen is simply taken in, and carbonic acid given out; that the combustion occurs in the capillaries of the body, and that there heat is evolved; and that it takes place by means of the oxygen which enters by the lungs.*

Robin and Verdeil, in their *Physiological Chemistry*, take substantially the same view. They regard heat as the *result* of nutritive changes of all kinds, but not the *object* of them. It is developed principally in the blood.†

“Carbonic acid gas exists in the lungs, the blood, the alimentary canal and the urine. The amount dissolved in the blood would be sufficient in its gaseous state to occupy from one-fifth to one-third of the space filled by the blood. There is more in arterial than in venous blood, (123 to 100,) as is the case with oxygen and nitrogen also. It is dissolved in both the serum of the blood and the corpuscles, while oxygen is dissolved principally, if not wholly, in the corpuscles. The fact of its greater amount in arterial blood confirms the idea that it is formed in the lungs by the action of pueumic acid on the carbonates in the blood.”

Bernard found the blood in the right side of the heart to be warmer than that in the left, and the blood in the ascending cava, just coming from the liver, a little warmer than that from the descending cava.

The function of the lungs then, so far as at present understood, is to take atmospheric oxygen, and other gaseous or volatile substances, into the blood,—to exhale a certain proportion of its car-

*Review of R. and V., page 199 Am. Med. Monthly.

† Dr. Walter Atlee's notes of M. Bernard's Lectures on the Blood.

bonic acid, and other effete or foreign matters,—and to cast off or absorb water in proportion to its excess or deficiency in the circulation.

Alcohol, either undecomposed or in the form of Aldehyde, [See note A,] is capable of existing for a length of time in the blood, and passes out by the kidneys, skin and lungs. Dr. Percy found it in the urine; it is often observed in the perspiration, and who has not a thousand times smelt it as it is poured from the lungs at every breath? That it is capable of existing largely in the blood is unquestionable. A medical friend in New Hampshire, Dr. J. C. Hanson, about twenty years ago bled a man who had been drinking freely for three or four days. The halitus of the blood burned for thirty seconds, with a blue flame, on the application of a lighted taper.

From the experiments of Dr. Prout, it is plain that alcohol so interferes with or prevents the healthy vital processes, as to cause the blood to retain an undue proportion of carbonic acid; for the Doctor found that after the alcoholic influence of the wine taken with his dinner had passed off, the exhalation of this acid recurred, and in a degree somewhat above the ordinary standard.

It is stated that the air in a diving-bell is sooner exhausted when the diver has taken distilled or fermented liquor, than when his drink has been water only. This being the case, it should seem that the alcohol, in some manner, steals away the oxygen of the blood to no useful purpose, but to its detriment, as it interferes with the escape of its effete materials.

The very interesting and valuable experiments of our countryman, Prof. N. S. Davis, have gone a step farther. They exhibit a manifest diminution of the vital temperature under the influence of alcohol.

“In the year 1850,” says Dr. Davis, “I devised a series of experiments designed to test more fully the effects of alcohol on the functions of respiration, circulation and animal heat. These experiments, commenced in the winter of 1850, have been continued from time to time since. The apparatus for performing the experiments consisted of a glass tube, graduated so as to indicate the fractions of a cubic inch, a very delicately

graduated thermometer, a mercury bath and a solution of caustic potash. With these arrangements, and an intelligent assistant, in a room of equable temperature, about three hours after any food had been taken, from three to four ounces of the best brandy that could be procured was administered. But previous to administering the brandy, the temperature of the body was carefully noted by inserting the bulb of the thermometer under the tongue, with the mouth closed around it for several minutes. A certain number of cubic inches of expired air was also collected in the graduated tube over mercury, and transferred from this to the bath of caustic potash, by which the amount of carbonic acid was rapidly absorbed and its quantity indicated. Having ascertained and noted the temperature of the body, the proportion of carbonic acid in the expired air, and the frequency of the pulse before the brandy was taken, these same observations were made in precisely the same manner every thirty minutes after, until three or four hours had elapsed. In some of the experiments, brandy was used as a representative of the stronger distilled liquors, and in others, port wine was used, in quantities of eight ounces at a dose, to represent the fermented liquors. The result of all my observations may be summed up as follows, viz.:

“1st. The most direct and obvious effect of alcohol on the human system is to excite or exhilarate the functions of the brain, and increase the rapidity of the heart’s action. This effect begins to be manifest within thirty minutes after the liquor is taken, and if the dose is not repeated, perceptibly declines in from one and a half to two hours. It is the exhilarating influence of the alcohol on the brain and nerves that gives it its fascinating power over the human appetite and passions, and has induced in the popular mind the general idea that it is actually tonic, or supporting to the functions of life. The stimulant effect on the vascular system is much less than on the nervous; the pulse being increased, in my experiments, not more than from six to ten beats per minute, while its fulness and force both remained unaltered.

“2d. It directly diminishes the amount of carbonic acid gas thrown out from the lungs in the expired air. This diminution

begins to be apparent in less than one hour after a single dose of alcoholic liquor, and becomes more and more so until the end of two hours, when the proportion of carbonic acid begins again to increase, and at the end of three hours comes fully up to the natural proportion. The amount of diminution of carbonic acid varied in different experiments, but was well marked in all. In some instances it was diminished, for a short time, more than fifty per cent. below the proportion when the experiment began.

"3d. In all my experiments the temperature of the system began perceptibly to diminish at the end of one hour, and continued to do so during the two succeeding hours, the mercury generally standing *three-quarters of a degree* lower at the end of three hours than when the experiment began; and at no period of time, while the effects of the alcoholic beverage remained perceptible, was there any *increase* of temperature indicated by the thermometer."

These results aid us in explaining a truth, well known to men of observation, in cold climates, that the human frame has less power of resisting cold, under alcoholic influence, than when free from it. The apparently discrepant fact that it blunts or destroys the feeling of cold, is fully compatible with an absolute diminution of temperature. Alcohol is a temporary excitant of the nerves, causing, like friction or other mechanical irritations, a sensation of warmth or glow.

Whatever relations alcohol may sustain to the blood and to the vital movements of the capillary vessels, it is plain that it diminishes their ability to withstand cold, causes a detention of the proportion of carbonic acid thrown off by the lungs in health, and so perverts the sensibility of the nerves as to render them incapable of correctly reporting external impressions. A man in liquor may freeze to death without any strong or painful perception of cold.

Sir John Ross's voyage from 1829 to 1833 was remarkable in its exposures and hardships, and in the fact that of a crew of twenty-three persons, only three died. This exemption the Commander attributes to unusual precautions, and especially to abstinence from intoxicating drinks. He says:

“It is difficult to persuade men, even though they should not be habitual drinkers of spirits, that the use of these liquors is debilitating, instead of the reverse. The immediate stimulus gives a temporary courage, and its effect is mistaken for an infusion of new strength; but the slightest attention will show how exactly the reverse is the result. It is sufficient to give men under hard and steady labor a draught of the usual grog, or a dram, to perceive that often, in a few minutes they become languid, and, as they term it, faint; losing their strength in reality, while they attribute that to the continuance of their fatiguing exertions. He, who will make corresponding experiments on two equal boats’ crews rowing in a heavy sea, will soon be convinced that the water-drinkers will far outdo the others.

“It is not that I am declaring myself an advocate for temperance societies, whatever may be their advantage, nor that I am desirous of copying a practice lately introduced into some ships, under whatever motives; but were it in my power in commanding a vessel, I would exclude the use of grog on the mere grounds of its debilitating effects, and independently of any ulterior injury which it may do, reserving it for those cases alone in which its use may be deemed medicinal, or, for any special reason, useful.”

This opinion and testimony may be considered as reliable, inasmuch as it comes from no sympathy with the temperance reform. Sir John Ross also speaks of “grog” as causing inflammation of the eyes, and as aggravating snow blindness; and of abstinence from its use as a preventive of scurvy.

Alcoholic drinks diminish *muscular power*. The well-known case of our countryman, Dr. Franklin, is in point. He could carry heavier weights, and had a greater power of endurance of labor, on his beverage of simple water, than his beer-drinking colleagues in a London printing office.

The Turkish porters at Constantinople and Smyrna are celebrated for strength. “The boatmen and water-carriers of Constantinople are decidedly, in my opinion,” says Mr. W. Fairbarin, an eminent machinist at Manchester, “the finest men in Europe, as regards their physical development, and they are all water-drinkers.”

My friend, Captain S. Rea, who, twenty years ago, frequently visited Smyrna, assures me that he never witnessed such feats of strength as are exhibited by the porters there. In unloading vessels freighted with Havana sugar, each porter carries a box of sugar upon his back from the vessel to the storehouse, and this is done all day without complaint. The weight is over four hundred pounds; as their pay is in proportion to the weight of their burdens, Capt. R. has frequently seen them call for a bag of coffee to be placed upon the box of sugar, and in one instance two bags, the weight being about seven hundred and fifty pounds. And what is still more extraordinary, from the office of Mr. Offley, the American Agent there, a porter was seen carrying a load of boards, so large that the individuals present had the curiosity to detain him, and to have it weighed. Capt. R. saw it weighed, and paid his proportion for the gratification. The weight was nine hundred and five pounds. The drink of these porters was nothing but water, and bread the staple article of food.

The Hon. Mr. Buckingham assured me that he had frequently seen, at Calcutta, those Himmalaya mountaineers, who are trained to athletic exercises, pitted against English grenadiers in running, leaping, carrying of weights, and throwing of missiles, and that one of them was equal in strength to two and three quarters of the English. Their sole drink was water, and their food rice.

In 1786, Jaques Balmat, that enterprising guide at Chamouni, who had long entertained the project of being the first to reach the summit of Mont Blanc, made the attempt, provided with food and a small bottle of brandy. He gave out long before completing the ascent, and returned. He next carried a bottle of wine with his food; this attempt failed also. A third time he took water only, with a little syrup to flavor it, for his drink, and succeeded in planting the first human foot upon the summit of that far-famed mountain.

Dr. Carpenter gives us the following statement of a coal-whipper: "It's food only that can give real strength to the frame. I have done more work since I have been a teetotaler

in my eight years, than I did in ten or twelve years before. I have felt stronger; I don't say that I do my work better, but this I will say, without fear of successful contradiction, that I do my work with more ease to myself, and with more satisfaction to my employer, since I have given over intoxicating drinks. I scarcely know what thirst is; before I took the pledge I was always dry, and the mere shadow of the pot-boy was quite sufficient to convince me that I wanted something. I certainly have not felt weaker since I have left off malt liquor. I have eaten more and drank less. I live as well now as any of the publicans do, and who has a better right to do so than the man who works? I have backed as many as sixty tons in a day since I took the pledge, and have done it without any intoxicating drink, with perfect ease to myself, and walked five miles to a temperance meeting afterwards. But before I became a teetotaler, after the same amount of work, I should scarcely have been able to crawl home; I should have been certain to have lost the next day's work at least; but now I can back that quantity of coals week after week, without losing a day. I've got a family of six children under twelve years of age. My wife's a teetotaler, and has suckled four children upon the principle of total abstinence. Teetotalism has made my home quite happy, and what I get goes twice as far. Where I work now, four of us, out of five, are teetotalers. I am quite satisfied that the heaviest kind of work a man can possibly do may be done without a drop of fermented liquor; I say so from my own experience. All kinds of intoxicating drinks is quite a delusion. We teetotalers can do the work better,—that is, with more ease to ourselves.—than the drinkers can. Many teetotalers have backed coals out of the hold, and I have heard them say, over and over again, that they did their work with more comfort and ease than they did when they drank intoxicating drink. Coal-backing from the ship's hold is the hardest work that it is possible for a man to do. Going up a ladder sixteen feet high with two hundred and thirty-eight pounds weight upon a man's back, is sufficient to kill any one; indeed, it does kill the men in a few years; they're soon old men at that work."

The influence of alcohol upon the *organization* is thus concisely indicated by that high chemico-physiological authority, Dr. H. Bence Jones: "In addition to the stimulating action of alcohol on the muscular structures and nerves, it acts through the circulation on every tissue; it produces a chemical effect. This is best seen when it is used for the preservation of morbid specimens. Even in the living body, this action may be observed, but it cannot be separated from the effect produced by the stimulating action. Thus alcohol hardens the skin when applied locally; it hardens and thickens the stomach. When long continued, it thickens the cellular tissues of the liver. It passes off by the lungs and kidneys, and affects both organs. Ultimately, it lessens the amount of carbonic acid expired, and hinders the removal of the products of decomposition by the urine. It changes the composition of the blood, and affects the nutrition of every organ and structure of the body. It has its own peculiar poisonous action on the muscles and nerves. As a poison, it has been placed, by its effect on the nerves and muscles, between ergot of rye and arsenic."

These, with kindred effects of its habitual use, are strikingly illustrated in the cases collected by Dr. Ogston: These are post-mortem examinations of seventy-three intemperate persons who came to sudden deaths: "42 by drowning, 5 by hanging, and 1 by suffocation; 20 of them were instances of violent death, either by syncope or by direct coma, speedily fatal, without vital reaction. The remaining 5 were cases of rapidly fatal coma, from narcotic poisons; of the whole, 25 were known to be cases of suicide, 13 of homicide, and 18 of accidental death, leaving 17 who must have died either from accident or suicide.

"Abnormal appearances within the cranium in 65 cases, or 79 per cent of the whole; brain indurated in 26 cases.

"Abnormal appearances in the respiratory organs in 41 cases, or 56.16 per cent. of the whole.

"Abnormal appearances in the pericardium, heart or aorta, in 30 cases, 41 per cent. of the whole.

"Abnormal appearances in the stomach in 20 cases, or 27.3 per cent of the whole.

“ Of the intestines, 10 cases, or 13.5 per cent of the whole.

“ In the liver 30 cases, or 41 per cent. of the whole.

“ In the spleen, 14 cases. Pancreas, 1.

“ In the kidneys, 33 cases, or 34.5 per cent. of the whole.

“ In the abdomen, 54 cases, or 73.9 per cent.

“ An entire absence of morbid appearances in the body, in one case.”

Time would fail to trace, with any degree of minuteness, the effects of alcoholic beverages upon the intellect and the moral sense.

A certain dose of wine or spirit increases the propensity for conversation; a little more causes garrulity; a further addition makes a vociferous exhibition of the thoughts, which run out without order or regularity. You will see two friends, after sitting an hour at a dining table well supplied with wine, talking into each other's face with great vehemence, neither seeming to pay the least regard to what the other is saying; this I have seen in Italy, from the influence of the native wine of that country. Among the uneducated, but by no means in that class alone, alcohol begets, in a company, a remarkable freedom of demeanor, exhibited by one spitting in his neighbor's face, tweaking his nose, or giving him a black eye, or some other form of familiar salutation.

The finer moral sentiments are superseded at the wine table by indelicate and impure associations which flow out in ribaldry and Bacchanal song.

A man's estimate of his own intellectual powers is often raised many degrees by a few glasses of wine. He gives his opinions, weak and puerile though they may be, with an oracular emphasis. If a doubt of their correctness be suggested, he kindles with resentment, demands satisfaction, and the matter ends, perhaps, in a duel or a murder.

Has not many a war, in which thrones have been overturned and countries desolated, had its origin in the misapprehensions and resentments caused by intoxicating drink?

Its influence upon the mind is not that of perversion only—but of ultimate prostration. Many a vigorous and educated

intellect has been reduced to imbecility or idiocy by distilled and fermented liquor. Dr. Howe in his Report on Idiocy to the Legislature of Massachusetts, makes the following striking statement.

“The habits of the parents of three hundred of the idiots were learned; and one hundred and forty-five, or nearly *one half*, are reported as known to be habitual drunkards. Such parents, it is affirmed, give a weak and lax constitution to their children; who are consequently, deficient in bodily and vital energy, and predisposed by their very organization to have cravings for alcoholic stimulants; many of these children are feeble and live irregularly. Having a lower vitality, they feel the want of some stimulation. If they pursue the course of their fathers, which they have more temptation to follow, and less power to avoid, than the children of the temperate, they add to their hereditary weakness, and increase the tendency to idiocy in their constitution; and this they leave to their children after them. The parents of number 62 were drunkards, and had seven idiotic children.”

What a wreck of intellect is exhibited in delirium-tremens. The miserable victim is pursued by imaginary enemies—serpents, wild beasts, and devils.

A man who had been a respectable merchant, in one of our Eastern cities, was on one occasion seen flying in terror from the pursuit of a shark which he supposed was in his hat, which he kept in close grasp under his arm. A significant instance of the *horrible grotesque* which characterizes this disease.

Prof. Huss, in July 1852, read to the Scandinavian Scientific Society at Stockholm, a paper on the Endemic Diseases of Sweden, in an abstract from which, it is observed, “The author devotes a long article to the *abuse of whisky* as one cause of the endemic diseases of Sweden. In the fact that chlorosis has become endemic in Sweden, first during the last twenty to twenty-five years, and in the other fact that the number of recruits disapproved of as below the regulation standard of height has increased 2.22 per cent. in ten years. Prof. Huss finds proofs of increasing debility of constitution in both sexes, of which he considers the

abuse of whiskey and coffee are main causes—enfeebling both parents and children. To the same causes Huss attributes a large proportion of the very common disorders of digestion." "Dr. Huss Professor of Medicine at Stockholm," adds my friend Dr. S. H. Smith, who was himself many years a resident of that city, "is a most philosophic practical-minded physician, standing deservedly at the head of the profession in Northern Europe, and has been guided in the composition of his paper, by the opinions expressed by the Provincial physicians in their annual official reports, as well as by his own extended observations." Dr. Smith stated to me the remarkable fact, that while he was physician to a hospital in Stockholm, of three hundred beds, no less than sixty persons died there in one year of delerium tremens. It is not difficult to comprehend this, when it is understood that for many years, more than a hundred and eighty thousand distilleries have been in operation in Sweden, to supply a population of three and a half millions with potato whisky.

As a prophylactic, or preventive of disease, alcohol has but slender claims to public confidence. If ever useful, during the prevalence of epidemics, it has been by allaying the panic which is one of the strongest predisposing causes of attack, at the same time, it is notorious that during the prevalence of cholera, for example, those who are in the habitual use of alcoholic drinks, are especially liable to become victims of the disease.

As a remedy in some forms of disease alcohol appears to be followed by good results. In the terrible symptoms produced by the bite of a venomous serpent, the rattle snake for example, we have pretty good evidence that alcohol, administered so freely as to keep the patient in a state of partial intoxication for a day or two, is followed by a gradual diminuation of the symptoms, and an ultimate cure. How one poison neutralizes or subdues another we cannot say, under our present limited knowledge of chemico-physiology, but this effect of alcohol is no more extraordinary than the successful treatment of the bite of venomous serpents of India and those of Martinique and St. Loucia, by the internal use of arsenic. The waking up of a patient from a deep unconsciousness with only ten respirations in a minute

feeble pulse and cold extremities, under poisoning with opium, by the free exhibition of belladonna as observed by Dr. Thos. Anderson is another analogous fact, though equally difficult of explanation.

In carbuncle, phlegmonoid erysipelas, and moist gangrene, wine or spirits given rather freely, often appear to be efficacious, in sustaining the vascular action for a limited period, until more enduring tonics and suitable food can be borne.

In low or adynamic fevers, some distinguished physicians have regarded alcohol as a valuable stimulus in the stages of deep prostration. When the first sound of the heart becomes weak, resembling the second sound, it has been regarded as a good rule to give alcohol and other stimulants; and when under this use the first sound of the heart becomes distinguishable, recovery is to be looked for. These fevers prevail in those countries where strong drink is freely used, and the masses are ill-fed, as in Ireland and Sweden; the intemperance of those countries probably creating the chief necessity for this sort of medication in their fevers.

In the treatment of tubercular phthisis there are members of our profession who place a high value upon brandy and cod liver oil. Cases have been adduced in which all the symptoms were greatly relieved, the patient improved in flesh and strength, and life apparently prolonged, even when an entire cure had not been wrought. Two and a half years ago, I saw a lady twenty-six years of age who for months had a severe cough, pain of the chest, and copious purulent and bloody expectoration, emaciation, and night sweats, joined with physical signs which gave decided indication of tubercular deposits and a considerable cavity in one lung. Brandy from one to three ounces a day, and nearly the same amount of cod liver oil were taken and persevered in for several months, and the patient kept a great deal in the open air. The flesh and strength gradually returned, and in six months the symptoms now being mild, she laid aside the brandy, but continued the oil six months longer, She now enjoys tolerable health though still afflicted with cough.

How far the benefit in such cases is to be ascribed to the

brandy, may fairly admit of question, since physicians to large institutions in London, for the treatment of consumption, as Dr. T. Thompson and Dr. E. H. Greenhow, had used the cod liver oil alone, with equal if not greater success.

In dyspepsia, alcohol has been used in various forms, but apart from the danger of its producing an artificial appetite for the medicine, and causing intemperance, it may be confidently asserted that the judicious employment of a suitable diet, bathing, exercise in the open air, freedom from care, with the aid sometimes of mineral waters, are greatly to be preferred.

Fortunately the spirituous infusions of medicinal substances are now almost superseded by the dry and fluid chemical extracts of vegetables which may be preserved for an indefinite length of time without the aid of alcohol, which in the tinctures, often renders them ill suited and offensive to delicate stomachs.

What class of men is so well acquainted both by scientific research, and by observation, with the mischievous influences of alcohol, as the members of the medical profession? Do not we, who claim to be a band of philanthropists, owe a high duty to our race in regard to this thing, and has not the sober and virtuous part of the community a right to look to us for our united and untiring exertions in every way toward confining this poison along with its congeners, arsenic, stychinia, morphia and prussic acid to the shelves of the apothecary?—A poison which diminishes the powers of bodily exertion, impairs health, shortens life, converts wise men into fools and maniacs, dissolves the ties and endearments of the family circle and of social life, and draws a dark and inpenetrable veil over the light of futurity.

Without chemistry, however, to elucidate this subject, observation and history present overwhelming evidence of the disastrous effects of alcoholic drinks to individuals, tribes and nations. As far back, almost, as the flood, drunkenness and revelry have exhibited the same features as exist in our own time. Drunkenness was no disgrace at the public feasts among the Greeks; indeed it was a maxim that he who was not drunk at the vintage feast of Bacchus, did not render true worship and honor to the

god. Many of the Roman Emperors were notorious drunkards, and Alexander the Macedonian conqueror, became intemperate—killed his best friend in one drunken fit, and died in another. The dissolution of powerful dynasties has often been connected with intemperance. In one night, when a king and his nobles were revelling in wine, an old and mighty dominion passed into the hands of a Medo-Persian chieftain who had an army disciplined to water drinking; and to the enervating influence of the wines of Capua upon Hannibal's army, has been attributed the fall of Carthage.

What a comparatively happy world would this be, if intoxicating drink could be put out of it. How remarkable that moderate drinking, the regular process by which drunkards are made, should be seriously proposed as a remedy for intemperance. It has been alleged that the drinking of wine and beer, will effect a cure, and yet these two articles kept the world drunk for centuries upon centuries before distillation was known.

There is but one remedy, namely, total abstinence from all that can intoxicate.

This is simple, safe and certain. The appetite of the intemperate man has been fitly compared to that of the tiger for blood. That animal, it is said, may be tamed and made docile so long as he is kept from the smell and taste of blood, but the moment blood touches his tongue his ferocity returns with all its terrors. So the appetite of the drunkard, merges every consideration connected with social position and moral responsibility. In the State of New-York, two thousand five hundred reformed drunkards were in one year brought back to confirmed intemperance by tasting fermented liquors.

The very fact that strong drink produces such an indomitable appetite, shows it to be a poison of no ordinary stamp. How different its effects from the simple and safe beverage prepared for man, by the benevolent Creator!

The appetite for water in a healthy individual, is regulated by the wants of the organs. When that fluid is deficient in the blood, there is thirst—when the supply is given, thirst ceases,

and the drinking of a pint of water to day, creates no appetite for the drinking of more than a pint to-morrow. This beverage sustains the healthy functions of the several organs of the body, [See note B.] while alcohol disturbs and deranges these functions, creates disease, and shortens life. Like arsenic, foxglove, and lead, its effect are cumulative. Men sometimes die of delirium tremens who have been habitual tipplers, but not drunkards—what kills them? The first dose, the last dose, the tenth, or the hundredth? Must not the result be the accumulated effect of the whole?

NOTE A.—Says Dr. A. A. Hayes, a most distinguished chemist, "undiluted alcohol consists of

4	equivalents of	Carbon,
6	do	Hydrogen,
2	do	Oxygen.

"This substance in its undiluted state introduced into the stomach, causes death, and is classed by toxicologists among the narcotic-acrid poisons. In a diluted state, mixed with from one to eight times its volume of water, it represents the active principle of nearly all the alcoholic liquors. Leaving out of view the volatile aromatic oils, the sugar, the vegetable matter, &c., of the fermented and distilled liquors, we have to consider the mixed vapor of alcohol and water exhaling in the body at a temperature of 98° F. This vapor, when it comes in contact with oxygen, either as a gas or dissolved in fluids, undergoes a rapid change, resulting in the formation of aldehyde, which consists of

4	equivalents of	Carbon,
4	do	Hydrogen,
2	do	Oxygen.

"This substance is the uniform product of the exposure of the mixed vapor of alcohol and water in contact with extended and porous surfaces to the smallest quantity of oxygen, the temperature of 98° F.

"The evidence of its production in the system, obtained by Ducheck and others, is sustained by appropriate chemical experiments."

As aldehyde may circulate in the blood without coagulating albuminous materials, and as it greatly resembles alcohol in some of its properties, being like it—highly inflammable, it may probably have been mistaken for it in experiments heretofore made.

NOTE B.—We have no evidence that alcohol enters into the composition of any of the living tissues of our bodies. It forms no part of healthy muscle, brain, nerve, membrane, ligament, bone or blood. It is foreign to the wants of the healthy vital economy, and when taken in such quantities as temporarily to quicken nervous or muscular action, it operates only as a stimulant or excitant, to bring into play a portion of the vital force which is as it were, laid aside for extraordinary occasions, but which can not be long kept in operation without undue exhaustion. It does not, like food, furnish the material which repairs the organs under the wear and tear of living action.

A writer in the Westminster Review for last July, takes the position that alcohol is food, and offers the following logic in proof of it.

"Food is force,
Alcohol is force
Therefore Alcohol is food.

We give a formula equally legitimate and conclusive, viz :

Horse feed is force,
Whipping a horse is force,
Therefore whipping a horse is horse feed.

